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Dr. Francis A. Arnold, Jr.

An Oral History

Director, National Institute of Dental Research

National Institutes of Health

Bethesda, Maryland

June 10, 1964

Interview with

Dr. Wyndham D. Miles

Historian, National Institutes of Health

History of Medicine Division

National Library of Medicine

Bethesda, Maryland

Dr. Francis A. Arnold, Jr.

30 December 1910 - 1 December 1967

Dr. Francis A. Arnold, internationally known dental researcher and fluoridation pioneer, was born in Orrville, Ohio. He received his B.S. degree from Western Reserve University in 1932 and his D.D.S. degree from that university in 1934. After serving his internship at the U.S. Marine Hospital in Cleveland, Ohio, he was commissioned in the PHS in 1936. He joined the staff of the Dental Research Section, NIH, in 1937, and served as assistant chief of the section from 1943-48. He was associate director of NIDR from 1948 to April 1, 1953, when he became its director. In 1965 Arnold was named chief dental officer and assistant surgeon general of the PHS. In 1967, shortly before his death, he retired from the PHS and joined the faculty of the School of Dentistry, University of the Pacific.

Dr. Arnold was one of the four PHS scientists who pioneered in the study of fluorides and their effect on teeth. He was the director of planning and research of the first fluoridation study undertaken by the government beginning in 1945 in Grand Rapids, Michigan.
May 15, 1964.

BIOGRAPHICAL DATA

NAME: Francis A. Arnold, Jr., Dental Director

TITLE: Director, National Institute of Dental Research National Institutes of Health Bethesda, Maryland 20014

DATE AND PLACE OF BIRTH:

December 30, 1910, Orrville, Ohio

EDUCATION:

1924-1928 Orrville High School

1928-1930 Arkansas University

1930-1934 Western Reserve University School of Dentistry B.S. 1932,

D.D.S. 1934

PROFESSIONAL CAREER:

1934-1936: Intern, U. S. Marine Hospital, Cleveland, Ohio
1936-present: Commissioned Officer in U. S. Public Health Service
1937: Assigned to Dental Research Section, National Institutes of Health
1943-1948: Assistant Chief, Dental Research Section, National Institutes of Health
1948-1953: Associate Director, National Institute of Dental Research
1953-present: Director, National Institute of Dental Research

FIELDS OF RESEARCH:

Oral pathology; oral bacteriology; epidemiology of dental caries and dental fluorosis; lactobacilli and relation to dental caries, and research administration.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

Fellow, American College of Dentists (pres. Wash. Sect. 1958-59) Fellow, American Public Health Association 7 -International Association for Dental Research (President, 1953) American Dental Association American Epidemiological Society
American Association for the Advancement of Science Washington Academy of Medicine Washington Academy of Science
Federation Dentaire Internationale (Vice Pres. Scientific Comm. 1954-1961)
Member, Board of Editors, Public Health Reports (1958-61)

HONORS:

OMICRON KAPPA UPSILON, 1934
MEMBER, COSMOS CLUB
HONORARY DOCTOR OF SCIENCE DEGREE, WESTERN RESERVE UNIVERSITY, 1962
CALLHAN AWARD, 1963
WILLIAM JOHN GIES AWARD, 1963
H. TRENDLEY DEAN AWARD, 1964
COLUMBIA U. ANNUAL ALUMNI RESEARCH AWARD, 1963

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Interviewer: Dr. Wyndham D. Miles

Q: Will you start out by telling where you were born, when, and anything about your childhood that you would like to put into this?

DR. ARNOLD: I might as well start with where I was born and proceed from there. I was born in the small town of Orrville, Ohio, December 30, 1910. I was born in a railroad working family. Orrville, Ohio, was a small junction on the Pennsylvania Railroad, and my father, at the time, was a superintendent of the yards in the railroad. My early life was the routine life of a small country town. The population of the town at that time was only about 4,000. Being in a relatively poor family or a family of lower income, a working family, it was necessary for me to pick up odd jobs and so forth, to increase my personal spending money, really, is what it amounted to.

In early life, reaching about the beginning of my high school years, I had the opportunity for two summers to work as a young assistant on the farm, so I have had a slight taste of farm life in the course of my career. I went to Orrville High School, entering the high school in 1924. About the end of my first year in high school, I had the opportunity to get a job in a dental office. Dr. William Heller, who was one of the small-town dentists practicing in Orrville at the time, was a close friend and actually early schoolmate of my father's. Dr. Heller gave me a chance to work after school hours and so forth in the dental office. This is probably the reason for my taking up dentistry as a career, having had this exposure in a dental office.

Q: What sort of things did you do?

DR. ARNOLD: At the time, working in the evenings, I was, you might say, clean-up boy in the office to begin with, then almost office maid when I started. But of course, it was not long until I started doing certain laboratory procedures. In a small-town office at the time, we did all our dentures. All laboratory procedures were done in the office, where today most dentists send out their laboratory work. This was not true in a small-town office such as Dr. Heller was operating at the time.

Q: Dr. Heller taught you how to make false teeth and things like that?

DR. ARNOLD: He definitely did. This was the primary types of laboratory work that I did at the time.

Q: What other things were in there?

DR. ARNOLD: Even then, we did our own casting of inlays, what little gold work was done in a small town, and if you would realize this was early in the days of casting of gold for dental fillings at all, the routine filling, of course, at the time was an amalgam filling or what was known as silicate cement. At that time it was considered artificial porcelain, but is recognized now as the same material used at the present time for anterior fillings.

Q: Did he actually teach you anything about the operations of dentistry?

DR. ARNOLD: The answer is yes. I started off, of course, doing laboratory work, but even before I was out of high school, I was doing some minor types of assisting at the chair. I became more or less what today might be considered a chair-side assistant. At the time we used one of the fancier types of fillings, a gold foil filling, a type of filling that's still used today. That type of filling is put in by more or less continuous malleting of very small pieces of gold foil. I stood at the chair many a time doing the malleting, hand malleting of the foil material, as Dr. Heller would hold the instrument in place and watch what was happening.

Q: Didn't any of his patients ever look rather askance at a high school boy assisting the dentist here?

DR. ARNOLD: I don't think so.

Q: "What's this boy doing here?"

DR. ARNOLD: In a small town, my family was well known in the town. They knew who I was, and even by that time, I was known by the favorite nickname that has followed me throughout life, namely "Pokey," which, incidentally, I inherited from my father. Many people ask me where did I get the name "Pokey," and the only story I have is that I can remember originally I was known as "Little Pokey," in terms of barbershop talk in a small town. Later, the "Little" was dropped and I became "Pokey."

But in reference to my high school education, I didn't spend all my time in the dental office, of course. I was fortunate enough to have very good teachers in high school. I had a couple of teachers, I don't think I could name them now. I was particularly interested in math and in science.

Q: What kind of science courses did you have?

DR. ARNOLD: The only ones we had available in the school at that time, in terms of science courses, as we see them today, I enjoyed my chemistry course very much. We had very reasonably exposure to chemistry in high school, and I had what I feel was a pretty good physics course in high school, which was unusual for a small town high school at that time. In math I became, without bragging, rather proficient up through algebra and geometry. In fact, a few times during my high school stage, in later years I went back and filled in a couple of times for teaching in algebra and so forth. While I was a senior, I was teaching sophomore students. It was a fill-in, but I'm proud of it.

I was fortunate in being able to get very good grades in school. At that time we were always competitive, even though high school, and I stood up right at the top of my class in the end, either coming out second or third in the class of some 50, 55 people.

I don't think there was any special influence in my high school, in terms of teachers and so forth. I was determined to go to college, and I would say my connection with Dr. Heller in the dental office sort of formed a pattern for my selection of a career of dentistry, rather than some other area. That's the only influence I can see in it. My father never had the opportunity of going to college, but he insisted on his children going. My sister before me had gone to college and my brother after me had gone to college, which reminds me, I was in a family of three, including a sister who actually was a half-sister of mine. She was my mother's daughter, and her father had died shortly after she was born. Then Mother married my father. Then through that marriage were myself and my brother, Elmer, who was about two years younger than I.

Then of the various incidences that happened in my life that I think did influence my life tremendously, if you think of the timing here, having been born in 1910, and my father a railroad worker, he got involved in unions. He was involved in the strikes back shortly after the war in 1920-21, in that period, one of the early strikes, the railroad strike at that time. Dad had been a rather prominent leader in terms of the union in town, and while he was in a supervisory position. I think they call them yard foremen or whatever they were at that time, foreman if the wrecking crew, he went out with the union at the time, which meant that the strike, of course, was never settled favorably. Well, I don't know whether it was ever settled favorably or not, but he changed his occupation then and went into one of the other companies in town, namely the Orrville Bedding Company, a mattress manufacturing company.

While working there, along about 1925 or '26—I'm not sure of the date—he, unfortunately, lost his arm in one of the machines that looked something like a cotton gin. It's a machine for pulling out raw cotton into a cotton matting. This became very definitely a shock to our family from an economic standpoint, and made things look pretty black. Then, fortunately, he happened to be the type of individual that didn't let something like that get him down, and he trained himself in a relatively brief period of time for office work, administrative work, and went into that type of work with the company. But this did make the picture of my going to college look a little bit dark about that time.

However, as I progressed to finishing high school, Dr. Heller, being a friend of my father and apparently liking me very well, was a bachelor and had a little bit of extra money, said that he would help me go to college. At the same time, another friend of my father's and of Dr. Heller's, again some of their boyhood friends, you might say, that had grown up in Orrville, a Dr. Harry Strauss. Dr. Strauss was an educator. He was professor of ancient languages out at the University of Arkansas. As head of the department, he also taught Greek and Latin and so forth at the university in Fayetteville. He knew the situation and had known me, having been a buddy of Dr. Heller's whenever he visited Orrville during the summer, which he did to visit his relatives, he would spend time up in the dental office and back in the laboratory. While the two of them were talking, I was working and making false teeth and so forth. But Dr. Strauss knew my high school record and my desires for a college career and to get into dentistry.

So he made arrangements for me to come out and live in Fayetteville, and made arrangements for me to do a job. He let me take care of his apartment, again more or less an apartment maid, you might say. He was also a bachelor. So I took care of his apartment and lived next door in one of the routine university dormitories. He got me odd jobs and so forth, arrangements at the university, where I picked up some money and managed to get through without going too much in debt, anyhow, between what my father could help me and what I could pick up working summers. Of course, I would return and work in the dental office in the summer.

I spent a full two years at Arkansas in my pre-dental work. I took some extra courses and managed to get in some 70-odd credit hours while I was there. Of the influences that were there, I'm thinking of things that may have influenced me into research as a career. I think I've painted the picture of why dentistry, although I do remember one person that tried to talk me out of dentistry, the head of the chemistry department at the University of Arkansas at that time.

Q: Was it Harrison Hale?

DR. ARNOLD: Harrison Hale was the head of the chemistry department when I was there at that time. But there was also another individual in chemistry that I admired a little bit more. He was a crippled chap. Hale was head of the department of chemistry at that time. But this chap got interested because I became very lucky when we got into quantitative analysis, and I happened to break the record of, shall we say, perfect results or however they graded results, that had been set there. It was fortunate on my part, but they tried to talk me into going into chemistry. But then another chap, Cossie, who I've noticed still publishes, taught us zoology and comparative anatomy. Probably due to the influence of their knowing I was with Strauss, and Strauss was head of department and well known in the faculty, they got to know me a little different than a routine student. But I wasn't quite outstanding. I wasn't poor in zoology at all. My poorest problem has always been English and a couple of those courses. Math and physics and the physical sciences and biological sciences area were no problem to me whatsoever. Cossie, I'll never forget, in talking to me, he knew that Hale and the other chap in chemistry were trying to talk me into a career in chemistry. Cossie knew my background and he said I would be foolish. He said, "Chemists come a dollar a dozen, 50 cents a dozen," or whatever his term was at the time. And he said, "I can assure you that if you go through and become a good dentist, people will travel all over the world to find you. Chemists travel all over the world to find a job." I'll never forget that. Of course, Cossie happened to be one of these, oh, you might say typical university professors. He was very outspoken and one of these unusual lecturers and one of these people that made unusual remarks in the course of his lecturing and so forth. I'm sure that neither thing influenced me, except that it did make me take an interest, and I think an interest that later became full blown, as you'll see in my life.

From Arkansas University, then I made up my mind very definitely to go on into dentistry, and the selection of school, again, that is, Western Reserve as the school for taking up dentistry, was the influence of Dr. Heller. That was his dental school. Of course, Western Reserve at the time was one of the top dental schools in this country, very strong, at least relatively speaking, in the basic science area, and a well-recognized school. It was a private school. It would have been cheaper, probably, for me to have gone to Ohio State, which would be the other natural selection, being an Ohio citizen, but I did matriculate at Reserve and have been happy about it ever since.

At the same time while I was down in Arkansas, I continued my relationship in Dr. Heller's office, my dental activities. This was my summer income. As you mentioned before about what types of work I would do, by the time I was through high school and during the summer months when I'd come back from Arkansas, from Fayetteville, to spend the summer in Orrville, I put full time into laboratory work. I was doing full time dental laboratory technician's work. Gradually, within the next couple of years here, I began to do more and more in the mouth. I did a lot of work on my own friends, my own family, and so forth. This is what you call "bushwhacking." I continued this throughout my dental education. I would go home from dental school over weekends, and I would sometimes make twice as many dentures and so forth over one weekend as we were required for a whole semester's work in the dental school itself. This had its impact on my dental education, I can assure you.

Q: That sounds as though it was a very good opportunity. I wonder how many other fellows in your class had an opportunity like that to do things on the side.

DR. ARNOLD: This is very rare and unusual. I think you must realize that this is illegal.

Q: It is?

DR. ARNOLD: Sure!

Q: I wasn't aware of that.

DR. ARNOLD: I was not a licensed dentist for laboratory work. I do not mean to say that laboratory work was illegal. Working in the mouth, of course, without a license is illegal. Before I was through dental school, I can assure you I had many bills owed me for dental work, which I would not attempt to collect, and I still have some of those. I think I could find some records of people that still owe me money, but I can assure you I'm not sending a collector for them. (Laughs) It wouldn't be cricket to do that.

I did have that type of experience. It made my college life probably quite different than routine. It wasn't long until the instructors in dental school knew what was going on, and so it wasn't long until, particularly as I got into my clinical years, the junior and senior years, I got my chances at selected patients because with that background, I had the chance of doing work faster. My clinical years were relatively easy, and the study of dentistry was easy in terms of dental subjects for me. I had a background and a knowledge that the other routine student does not have the opportunity of having. It did give me a chance to probably spend more time on basic science studies. I'm thinking of such things as the biochemistry and physiology, because my technique courses were much simpler for me than an individual who was just starting. So I had more free time than the average person really has. I'm sorry I didn't spend more of this free time than I did in studying, but it did give me an opportunity to maybe spend more time studying. Thus, I had the opportunity of getting good grades in my dental school work, and obviously my clinical work, I could get good grades.

I don't claim to be the best technician, but I was naturally ahead of even maybe people that are more adept in the use of their hands and in the artistic side of dentistry than I. I just had had the experience of working. It didn't bother me to go work in a patient for the first time; I had worked with patients a couple of years before that for the first time. It didn't bother me about patients passing out or fainting or something, because I'd already had that happen to me. I'd had that happen to me in the office when I was the only one there and all alone. So I knew some of the experiences. As I say, it also didn't take long for the instructors to let information, because Orrville was only 50 miles from Cleveland, and people commuted between the places and communicated between the places. So that information got around. They just never asked me the question of whether I was practicing or not when I went home over the weekends.

Don't forget, these were tough times, too. This was in the early Thirties. I was treasurer for the fraternity and steward, running the fraternity lunch. We ran the lunch in order to pick up a free lunch and all, get a little help to pay my room and board. I can remember when the banks closed, and here I was, people had paid me the money to have lunch, and I was supposed to furnish food, and I couldn't get any money to buy food. They didn't offer credit to fraternities very freely at that time, so I remember my headaches of college days during the Depression. Of course, this hit my family and all, which meant money was not easy to come by.

I remember I went to school after my second year, starting my junior year, and went back home. I got there and I had no way of paying tuition, didn't have enough, and what little I could get in terms of the school, what little they had at the time, because they were bad off, too, I went back home. I was home about three days, and some kind lady by the name of Mrs. Beyer, who had a little extra money, she called me up. She knew me. Of course, she had had work done in the dental office. I had never done any work on her; Dr. Heller did work on her, but she knew my background and all. She offered to loan me enough money to get through the next two years.

Q: That was mighty fine of her.

DR. ARNOLD: It was. Dr. Heller did not have the money. He lost his money in the stock crash, so he went completely broke. She did. I'm very thankful. She's still living, and whenever I go to Orrville, I try to go up and see her. She's a very sweet lady, elderly, of course.

Going back to my school, due to the extra time and all that I managed, shall I say, having had the experience in the dental office prior to this and while I was there, and extra time, the other influence in my life that relates to where I am now was the fact that Dr. Thomas Hill, who was a professor of pathology in the dental school and associate professor of pathology in the mental school, taught both general pathology to me and oral pathology. He became interested in me. He happened to know some people in Orrville and had heard of me and my background. Of course, he knew me from the first year or two in school. He got the opportunity to give me a job in his laboratory. This was along about 1933. They put on this program. It wasn't a WPA program; it was of that group, where there was federal money made available to college students. It was 50 cents an hour for laboratory assistants and things like that. So he got allocated some of these funds for his department, so I used to spend evenings and odd hours when I'd get off from dental school. In dental school, up in the junior year, you don't have many free hours, because you're working pretty well all day, but in the evenings I would go over and work in his laboratory, making pathological, doing sectioning and regular histological technique work, prepared class specimens and slides and so forth, and got to know Dr. Hill.

At the time, our laboratories were in the Institute of Pathology, and even then the Institute of Pathology at Western Reserve was a very active research group and still is. I got to know not only Dr. Hill, of course, but Dr. Chase in histology, Dr. Hanson in biochemistry, and a few people like that, that have contributed to biological research and were doing biological research at the time. So I got an exposure to research. I continued my work with Dr. Hill after graduation, in terms of that phase of it all, you might say. I went ahead and graduated from Reserve in 1934.

During my last year, of course, I began looking forward to what I would do. Well, as you well realize, it would be natural, and the whole plan when I had started this, finishing high school, was that I would return back to practice in Heller's office in Orrville. This was the setup that was more or less obvious in terms of what would happen. I think two things happened here. As I learned more about dentistry and the practice of dentistry, I got a little bit disgusted with it, disgusted with the way dentistry was practiced in small towns. It really didn't have a future. Economically, you made a good living, but I was a little bit disturbed about returning to a small-town, four-wall office setup after the education I had had.

In addition to that, and I don't know how all this comes about, knowing the people in dental school, the staff, the teachers, probably a little bit differently than many did, due to my background, as I say, my experience in their knowing what I had done, and the ease with which I got through the clinical phases of dentistry, I got more encouraged toward an academic career. Of course, Hill and the group over at the Institute kept pushing me, you might say, toward a research career in dentistry. Well, this meant that I wasn't going back to Orrville to practice, and this is still '34, and money wasn't running around anyplace. At the time there were very few scholarships of any sort, so we did look over the potentiality of a fellowship or scholarship.

I did have the opportunity at the time of going up to Rochester, which might have changed my whole career, and a chance of going to Forsythe Institute up in Boston, which is now connected with Harvard. Neither of those paid very much money. In fact, you could hardly get along on what they paid. You still had expense. I was at the tail end of putting money out; I had to find a way of getting money in.

I did have the opportunity then, through Dr. Hill and school, of coming into the Public Health Service, getting an internship in the Public Health Service. While that internship at the time paid \$100 or \$125 a month, plus board, room, and so forth, this was income and not all out-go in that case. So I did get appointed to an internship in the hospital in Cleveland. I assume that Dr. Hill or some of his friends at Reserve managed to see that I got assigned to Cleveland, because I knew Hill was interested in me carrying on my work with him in his laboratory, which I did. Then he helped me, and we arranged my first research project. I was interested in the first project we got on to, by selection and advice from Hill, I think, was a very simple project, using the techniques that I had learned, namely histological techniques on how to cut teeth, grind teeth, and so forth, and study them microscopically.

People, particularly a group out in Iowa, were proposing the application of silver nitrate on deciduous teeth, particularly anterior teeth, to stop decay, which is quite interesting, I think. Dr. Hill happened to be the type of person that believed that a young person started research, such as myself, for his first project should do something that he can get a result, yes or no. So together we worked out a relatively simple experience, which was namely: By treating a tooth with silver nitrate, do you make it less soluble to acid? Which became just a straight chemical experiment in terms of treating teeth and then analyzing the rapidity of their solubility in different buffered acid solutions. So that was the background of the first research experiment I ran and reported on, and was the basis of the first report I ever made. This was made at the meeting of the International Association of Dental Research. I'm not positive whether it was 1935 or '36.

Q: Were you doing this work as an intern?

DR. ARNOLD: No.

Q: This was separate from your work as an intern?

DR. ARNOLD: I was doing this in the evenings. Interns were then in the Marine hospitals, now the Public Health Service hospitals.

Q: What did you do as an intern?

DR. ARNOLD: The work I did as an intern was routine dental service work in the hospital. We did not have at that time the rotating type of internship that the Public Health Service has in dentistry today. It was regular dental work for beneficiaries of the Public Health Service, seamen. At that time, Cleveland Hospital was quite an active hospital.

There was a lot of shipping, all the Great Lakes shipping and all. We were taking care of all the Coast Guard, Army, Navy, and the whole group in the Cleveland area, so it was very active for a small hospital. Cleveland Hospital was about a 300-bed hospital.

Q: They must have kept you pretty busy, doing this work during the day and then research at night.

DR. ARNOLD: It wasn't that hard. I enjoyed the work. Mrs. Arnold lived right down close to where the university was, so I had to go down there for my dates in the evening, and I'd stop off at Tom Hill's office.

Q: It sounds as though you were single when you were doing this, because this isn't the kind of thing a married man would do.

DR. ARNOLD: I had time. I was single. I couldn't afford to get married. She lived down there by the university. She was working at the university at the time. She also graduated from Floristone Manor, which is the women's college for Western Reserve University. She graduated in '33, a year before I. After graduation, she was working at the university. So this was sort of a happy arrangement. I'd go down over the hill and then work for a couple of hours in Tom Hill's laboratory, then go over and maybe go out for a Coke. We didn't go drinking much beer or anything at that time because we didn't have the money to do that.

Most of this work with Hill was done in the evenings and over weekends, things like that. We weren't working that hard at the hospital, and it was fun. I enjoyed it. He had free time in the evenings, too, and he'd be down there many an evening, and we'd work together. It wasn't that profound an experiment, as I see it today. It was an interesting one. In fact, I think one of the interesting facts in that, and I still remember it, was that as I went into this experiment and began to get some results. And all, then taking my results, as I thought I had completed an experiment, I had completed one phase of a minor experiment is really what had happened, and we reported. I think Hill wanted me to report it at the IADR meeting simply to give me the experience of standing up and defending my experiment. But anyhow, we did that.

As I finished it and then took it to more experienced people and to Hill himself, they then started asking me the questions of why had I gotten the result. Up to then, I had just gotten a result and I had not really considered why. It was during the discussions and also of going through the literature and studying the problem a little bit more, that I became interested. Actually, I was wondering whether chlorination of a water supply would increase dental decay, dental caries. Then my reasoning behind this was that after we went in and I took my results to the biochemists, then they wanted me to go back and start why. Then I had to find out what had the silver nitrate done and why had it changed the solubility, because it did decrease solubility. And was it the silver ion? And what was coming off? This was just by weight measurement, dissolving a weighed sample of enamel and of dentine, and then weight differential during a time period versus a concentration of acid. But then they posed the problem which naturally comes up then: "What did change and how was it changed?" We got to discussing it, and, of course, it was easy to show that certain of the components of enamel went off more rapidly than others, and also that chloride entered into this picture, that is, the chloride ion.

So I began to wonder, and I can remember many discussions along this line with Tom Hill and all, of whether chlorination of the water supply increased dental decay, basing it on the rationale that we knew from the experience that as civilization had gone along and, shall we say, advanced, dental decay has advanced. One of the factors over the past many years of advance has been chlorination of the water, purification of water supplies. I was wondering whether this might relate.

We also fooled around with the potentiality of fluoride as being one of the elements that would decrease enamel and dentine solubility. But really, my thought was to try to follow through from an epidemiological standpoint on the chlorine, chlorination, and so forth of the water supply. Well, it was about that time that Tom Hill saw that I was interested in research, and I knew I was interested enough in research to go on. I was already in the Public Health Service, had been commissioned in the Public Health Service. I was commissioned in 1936. We got in touch, and Hill suggested that I try to get assigned with Trendley Dean here at NIH. Trendley, at the time, was working on water supplies, and this was prior to dental caries picture of fluoride, but had been working on water supplies and the relationship of fluoride and fluoride waters to mottled enamel. Hill knew Trendley Dean quite well, and he knew Messner, who was the chief dental officer at the time. So that gives the background of how I got assigned, finally, to NIH.

Next time, we might start a little more with my internship.

End of first interview